

Exploring Teachers' Practice of Technology Use in Blended Teaching: A Qualitative Inquiry

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ABSTRACT This qualitative study investigates how 14 faculty members recruited via purposive sampling integrate technology within a blended learning context at Cagayan State University-Aparri, utilising the SAMR model as an analytical framework. Semi-structured interview data were analysed using Braun and Clarke's (2006) thematic analysis. Findings revealed that technology utilisation spans a developmental spectrum from instructional enhancement to pedagogical transformation. In lesson presentation, faculty advanced beyond tool substitution, leveraging multimodal platforms and blended classroom architectures to achieve augmentation and modification. In facilitating discourse, the strategic use of synchronous collaborative workspaces shifted practices into modification and redefinition by establishing an elastic instructional loop. Finally, in evaluation, the deployment of gamified platforms and real-time diagnostic visualisations modified traditional testing paradigms into dynamic feedback loops, while automated analytics pushed practices toward redefinition. Collectively, the findings demonstrate that technology has matured from an ad hoc additive into a structural element that fosters transformative, student-centred learning.

INTRODUCTION

Current educational landscapes are witnessing the introduction of a plethora of novel educational technologies aimed at enhancing blended and or hyflex learning experiences. The educational landscape has evolved far beyond a broad spectrum of isolated tools and strategies aimed simply at boosting communication or instructional delivery. Today, it encompasses a sophisticated architecture of online learning delivery systems, digital platforms, virtual environments, and interactive applications that actively shape synchronous and asynchronous learning setups (Roa et al. 2025; Kalyani 2024). This integration of technology fundamentally altered traditional teaching practices during the COVID-19 pandemic through the widespread adoption of blended learning models. As Talosa et al. (2024), Buckley et al. (2025) and Sotto (2026) assert, the COVID-19 pandemic compelled educational institutions to switch from traditional classroom instruction to online and virtual instruction drastically replacing variety of teaching and learning modalities, bringing into gargantuan practice, the utilisation of the blended learning approach. By combining face-to-face instruction with online components, blended learning has intro-

duced a significant pedagogical shift with the potential to enhance accessibility, student engagement, and personalised learning, leaving higher education institutions with a permanent mandate to maintain robust learning continuity plans for any future disruptions.

Within this new educational paradigm, academic life has undergone a profound alteration as information and communication technology (ICT) reshapes modern society. Young people's perceptions and management of knowledge, as well as how they construct their own learning experiences, have fundamentally evolved (Lawrence and Tar 2018). This constant advancement of technology places intense pressure on traditional teaching strategies and teacher competency needs (Artacho et al. 2020), prompting a critical call to renew instructional methods around the true pedagogical potential of ICT (Starkey 2020). When properly leveraged, these tools foster praxis innovation, active and collaborative work (Blau and Shamir-Inbal 2017), and learning flexibility (Sargent and Casey 2020). From a sociocultural standpoint, ICTs act as cultural artifacts and meaningful objects that mediate the teaching and learning process. When educators employ them deliberately, it enables them to self-regulate their practice and bring about

meaningful changes across the cognitive, emotional, and psychological dimensions of education (Bicalho et al. 2023). Consequently, educational institutions must prioritise integrating these tools to support constructivist teaching and expand student participation in the knowledge society (Scherer and Siddiq 2015). Because effective technology use is well-documented to improve lesson delivery and support diverse learning styles (Huong and Hung 2021; Ho et al. 2021), understanding teacher acceptance of these digital ecosystems has become critical for long-term educational continuity (Taimalu and Luik 2019; DeCoito and Richardson 2016).

Despite this growing body of macro-level research on blended learning, a significant gap remains in understanding how teachers practically implement these technologies at a micro-level within their specific classroom strategies. Apparently, there has been many recorded significances of the integration of hybrid or blended modalities. These advantages include the utilisation of platforms to mentor students simultaneously (Hodgson and Shah 2017), and stay in touch across time and space (Hussain 2018; Thaheem et al. 2021), yet less is known as to the actual practices faculty members configure technology integration during real time student interactions and course assessments.

In the existing literature, these practices are frequently oversimplified into a binary choice between teacher-centred traditional or student-centred constructivist pedagogies. This broad classification obscures the nuanced, developmental nature of technology adoption. It fails to examine how teachers navigate the transition from using technology as a mere tool for convenience to using it as an engine for genuine structural change. There is an unspoken empirical gap regarding whether teachers are simply replacing old mediums with digital equivalents or if they are executing deeper instructional innovations.

To bridge this conceptual gap, this study utilises Ruben Puentedura's SAMR (Substitution, Augmentation, Modification, Redefinition) model as an analytical lens to evaluate the digital transition. The SAMR framework serves as a pedagogical ladder, dividing technology utilisation into two main tiers, namely, the Enhancement phase, which consists of Substitution and Augmentation, and the Transformation phase, which comprises Modification and Redefinition. In the Enhancement

phase, digital tools act as a direct substitute or offer functional improvements without changing the core nature of the task. Conversely, the Transformation phase allows for significant instructional redesign or the creation of entirely new, previously inconceivable learning tasks.

Educators are therefore challenged not only to adopt digital tools but also to evaluate how these technologies influence pedagogical practices and contribute to meaningful learning experiences. As Zamri and Mohamad (2025) emphasized, the Substitution, Augmentation, Modification, and Redefinition (SAMR) Model provides educators with a systematic framework for examining technology integration, encouraging progression from basic technology substitution toward transformative instructional redesign that aligns with the goals of 21st-century education.

As educators negotiate the challenges of integrating technology with pedagogical practices, the use of Technology Integration Models has become increasingly popular amid these changes in education (Ranbir 2024). In this changing environment, Puentedura's Substitution, Augmentation, Modification, and Redefinition (SAMR) Model is a pillar. The SAMR Model gives teachers a methodical framework for assessing how much technology affects instruction and learning (Nair and Chuan 2021). The four levels of technological integration, that is, Substitution, Augmentation, Modification, and Redefinition, each represent a different stage of the influence of technology on teaching methods.

This study explicitly addresses the gap in the literature by exploring the actual practices of faculty members at Cagayan State University (CSU) Aparri as they utilise technology for blended teaching, mapping their strategies directly against these four SAMR levels. Through qualitative inquiry, this research examines how faculty members integrate multimedia tools, foster communication through digital platforms, and adapt assessment methods, thereby moving beyond a simple inventory of the tools they use to reveal the pedagogical intentionality behind their instructional choices.

The significance of this study manifests across several critical dimensions of higher education as blended learning environments continue to mature. For institutional administrators and policy-makers, this research provides a localised diagnostic snapshot of technology maturity at CSU

Aparri, offering data-driven insights necessary for crafting targeted professional development and robust institutional learning continuity plans. For instructional designers and curriculum developers, unearthing how multimedia presentation, dialogic interaction, and gamified evaluation function from the teacher's perspective provides an actionable blueprint for designing hybrid courses that maximise social and cognitive presence.

Furthermore, practicing educators can utilise these findings as a reflective guide to intentionally elevate their own digital instruction from basic functional substitution to transformative, student-centred learning experiences. Ultimately, by applying a well-established theoretical model to a contemporary post-pandemic blended learning environment, this study enriches the broader literature on educational technology and sets an empirical stage for further exploration into the systemic challenges and opportunities of digital praxis innovation.

Objectives

The present study aimed to explore the main question of how faculty members integrate technology in their lesson design while using a blended learning delivery system. Using Puentedura's SAMR Model as its framework for analysis, the study evaluates instructional choices through the theoretical lens of determining the degree to which digital tools are utilised to either enhance existing traditional methods or fundamentally transform the pedagogical landscape.

Specifically, this study examined how faculty members of Cagayan State University at Aparri navigate the different levels of the SAMR model, that is, Substitution, Augmentation, Modification, and Redefinition, in designing, delivering, and assessing instruction. It sought to explore the practical implementation of technology integration and the pedagogical decisions underlying its use providing empirical insights into the extent of purposeful technology integration.

METHODOLOGY

Research Design

The main purpose of this study is to investigate how faculty members at Cagayan State University in Aparri, Philippines integrate and utilise

technology in a blended learning setting. Grounded on this purpose, the study made use of qualitative descriptive design. The design suits the objective of the study as qualitative descriptive provides straightforward and rich description of participants experiences, strategies and practices without manipulating the natural teaching environment.

Participants

The participants consisted of 14 faculty members from various academic disciplines at Cagayan State University-Aparri Campus, Philippines. The campus is one of the nine satellite campuses of the university that implements the Learning Environment Network System (LENS) as its institutional blended learning platform.

The participants represented diverse academic programs and varied in terms of academic rank, employment status (regular/full-time or part-time), years of teaching experience, and disciplinary specialisation, allowing the study to capture a wide range of perspectives and experiences regarding technology integration in blended teaching.

Participants were selected through purposive sampling based on their experience in blended instruction and their active use of technology in teaching. To be eligible for participation, faculty members had to possess at least one year of teaching experience, be actively teaching at Cagayan State University-Aparri Campus during the conduct of the study, and have utilised the LENS platform for at least two academic semesters.

Data Collection

Upon receipt of the special order authorising the conduct of the study, the researcher invited faculty members to participate. Fourteen faculty members voluntarily agreed to participate after providing informed consent.

Prior to the actual interview, the author ensured that the interview guide developed based on the study objectives and the constructs of Puentedura's (2013) SAMR model was validated. To establish content validity, the interview protocol was reviewed by experts in educational technology and qualitative research, who evaluated the clarity, relevance, and alignment of the questions with the study objectives. Their recommendations were incorporated into the final interview guide. Prior to

the actual data collection, the interview protocol was pilot tested with faculty members who were not included in the study to ensure that the questions were understandable and capable of eliciting rich, relevant responses.

Interviews were scheduled at the actual participants' convenience and conducted either face-to-face or through an online platform. Each semi-structured interview lasted approximately 30 to 60 minutes and was audio-recorded with the participants' permission.

The semi-structured interview consisted of open-ended questions that explored participants' experiences with technology integration in blended teaching, including lesson presentation, student-teacher interaction, collaborative learning, and assessment practices. Follow-up probing questions were used, when necessary, to obtain clarification and deeper insights.

The interviews were transcribed verbatim and analysed using thematic analysis. To enhance the trustworthiness of the findings, the researcher maintained field notes throughout the interviews, and emerging themes were continually compared across participants to ensure consistency and credibility of interpretation.

Data Analysis

To analyse the interview data, thematic analysis was employed. The transcriptions were read and reread prior to coding to determine the recurrent themes and patterns in the teachers' responses. After which, the transcriptions were closely examined and coded. Inductively, initial codes were deduced from the data. These codes were then grouped into more general and broader themes through an iterative process. Adhering to Braun and Clarke's (2006) six-step framework, the analysis concentrated on comprehending how technology was incorporated into lesson delivery, the impact on student engagement and interaction, and how digital tools were used for assessment. This required familiarising oneself with the data by transcribing it verbatim, creating preliminary codes, looking for themes, comparing themes to the dataset, defining and naming themes, and creating the final report.

Ethical Considerations

Ethical approval for the study was obtained. Informed consent was secured from all participants,

ensuring that they were aware of the purpose of the study, the voluntary nature of their participation, and their right to withdraw at any time without consequence. Participants were assured of confidentiality, and the protection of their identities in the reporting of findings.

Limitations

While the study provides valuable insights into teachers' practices in using technology for blended teaching, it is limited by its small sample size and focused on a single university. The findings may not be fully generalisable to all educational contexts, particularly in institutions with different technological resources or teaching environments. Because this study focused on a single institution (CSU Aparri) with a sample of 14 faculty members, the findings offer contextual transferability, providing deep insights that may inform similar state universities in the Philippines navigating post-pandemic blended instruction.

RESULTS

To critically evaluate how faculty members of Cagayan State University at Aparri leverage digital tools in blended environment practice, this study applies Puentedura's (2013) SAMR (Substitution, Augmentation, Modification, Redefinition) model as its theoretical anchor. The SAMR framework serves as a pedagogical ladder, dividing technology utilisation into two main phases of Enhancement (where technology optimises traditional methods) and Transformation (where technology fundamentally restructures the learning experience).

Three key themes emerged from the analysis of participant responses on their technology utilisation within their instructional designs. Prevalent from the responses were the themes of lesson presentation, dialogic interaction and collaboration, and assessment and evaluation.

In the context of multimodal presentation, teachers at Cagayan State University-Aparri campus Philippines incorporate digital tools such as multimedia content, interactive platforms, and online resources to enhance engagement and understanding. Thus, elevating from basic digital substitution to the structural enhancement/transformation of lessons.

Table 1: Qualitative summary of identified themes, practical applications, and corresponding SAMR levels

<i>Theme</i>	<i>Faculty practice</i>	<i>SAMR model level</i>	<i>Pedagogical impact</i>	<i>Frequency of response</i>
1. Multimodal Lesson Presentation	Use of multimedia slides, video clips, Canva, and curated digital resources to deliver lecture content.	Enhancement (<i>Substitution to Augmentation</i>)	Replaces static print/chalkboard delivery with interactive media, offering direct functional improvements in clarity and student engagement.	14
2. Dialogic Interaction and Collaboration	Implementation of real-time discussion boards, messaging platforms, and collaborative cloud documents.	Enhancement to Transformation (<i>Augmentation to Modification</i>)	Shifts communication from periodic classroom -only exchanges to continuous, real-time feedback and peer co-creation of knowledge.	13
3. Assessment and Evaluation	Adoption of online quizzes, automated grading systems, and digital student portfolios.	Transformation (<i>Modification to Redefinition</i>)	Restructures evaluation from traditional periodic testing to continuous tracking, instant feedback loops, and personalised learning pathways.	11

Source: Author's qualitative interview data collected from 14 faculty members of Cagayan State University-Aparri Campus, Philippines, March 2024

Dialogic interaction and collaboration focuses on how technology facilitates communication and collaboration between students and teachers, allowing for real-time discussions, clarification of concepts, and collaborative learning experiences.

Lastly, assessment and evaluation practices leverage technology through online quizzes, automated grading systems, and digital portfolios, enabling teachers to track student progress, provide instant feedback, and support personalised learning paths.

As illustrated in Table 1, technology integration in general spans both the Enhancement and Transformation phases of the SAMR continuum. While lesson presentation practices primarily reflect functional enhancements (Substitution and Augmentation), collaborative and assessment strategies demonstrate emerging transformational shifts (Modification and Redefinition) in faculty members instructional design. These practices reflect how technology in general in the context of blended teaching and learning can transform traditional teaching methods and foster a more dynamic and interactive learning environment.

DISCUSSION

To examine how teachers operationalise blended teaching in their instructional delivery, participants were asked what digital or online strategies

they use in tandem with in-person classroom practices. This question sought to surface teachers' lived experiences and instructional decision-making processes in blended environments. Analysis of the responses revealed notable similarities in teachers' practices, suggesting a shared understanding of blended learning as a strategy for enhancing student engagement and performance. Faculty members consistently reported using online platforms not merely for content delivery, but also for interaction, practice, and assessment aligned with the syllabus requirements. This finding suggests that blended learning at CSU Aparri is implemented in a structured and pedagogically intentional manner rather than as an ad hoc supplementation of face-to-face instruction.

Theme 1: Multimodal Presentation: Elevating from Basic Digital Substitution to the Structural Enhancement/transformation of Lessons

Lesson presentation is the phase where faculty members explain important lessons. Qualitative analysis unveiled that teachers strategically integrate technology to enrich lesson presentation and improve instructional clarity. Lesson presentation is made through the use of multimedia elements such as videos, interactive slides, and virtual demonstrations where faculty members transform traditional lectures into more dynamic and engaging

learning experiences with these technological integrations. This practice reflects an instructional shift toward multimodal teaching, where information is presented through multiple sensory channels to support diverse learning preferences.

The preliminary phase of technology adoption typically commences at the Substitution level, exemplified by the use of digital slides in lieu of traditional board writing. However, the faculty in this research exhibited advancement towards Augmentation and Modification through the incorporation of interactive platforms and multimedia elements. Rather than using digital tools as mere substitutes for physical whiteboards, faculty members demonstrated instructional agency by curating external repositories. Hence, elevating their technological utilisation practice to the level of Augmentation where technology provides clear functional improvements to content delivery. These shifts support the assertion that multimodal visual representations reduce cognitive load and promote active engagement in blended learning environments.

Recent findings mirror this result as Novoa-Echaurren et al. (2025) found that reflective practice is crucial for refining the practice and foreseeing the meaningful uses of digital technology in learning. Similarly, Bicalho et al. (2023) highlighted that teachers declared positive experiences in reference to the improvements achieved from the functionalities presented by ICTs, taking them as a redefinition of their own practice. However, from the SAMR model, which helped to analyse the teachers' reports, it is observed that most of the declared experiences tended to integrate ICTs in the levels of Augmentation and Modification, corresponding, according to the model, to the passage of the range of improvement to transformation.

One participant explained that online resources are used to reinforce face-to-face instruction, stating, *"I get videos, PowerPoint presentations, and handouts of textual materials from sources...including YouTube, repositories, search engines, and databases."*

Analytically, this practice demonstrates teachers' agency in curating digital content to scaffold understanding and deepen conceptual explanations beyond what can be achieved through oral lectures alone. Bobek and Tversky (2016) highlighted that advantages in the generation of visualisations to learners across modalities, from verbal format into visual format advances learning.

Mirroring these similar findings, Talosa et al. (2024) highlighted that higher education institutions are trying to provide more flexibility and individualisation, which is mainly realised through the use of new technologies and implemented in online or blended learning designs. Furthermore, looking closer at the practices reported in consensus by the participants on the use of Learning Management Systems like the Learning Environment Network System, Google Meet and Zoom further indicate that multimedia integration is not an isolated practice but a shared instructional strategy among faculty.

Learning Environment Network System, Google Meet and Zoom utilisation by faculty members highlights the role of digital tools in supporting both synchronous and asynchronous learning. For instance, a participant (P4) described uploading lecture materials in advance to allow students to prepare for subsequent discussions, suggesting a flipped or semi-flipped instructional approach. Such technology integration practice enables teaching and learning sessions to be devoted to clarification, interaction, and application of concepts, thereby maximising instructional efficiency.

From the perspective of the SAMR framework, the findings suggest that faculty members employed digital technologies not only as substitutes for traditional instructional materials but also as tools that enhanced and, in some cases, transformed learning experiences. Similar evidence was reported by Macaulay and Akpan (2025), who found that students' use of recorded lecture videos, learning management systems, social media platforms, and educational applications contributed significantly to deeper learning and improved academic performance. These findings support the notion that purposeful technology integration extends beyond improving instructional efficiency to creating richer and more meaningful learning experiences.

The use of multimedia-supported group activities and video clips indicates teachers' attempts to maintain students' focus and create a stimulating learning environment. Synchronous sessions (whether through Google Meet or in-person) are optimised for higher-order conceptual application and real-time clarification by moving low-stakes content consumption online. An additional example of a pedagogically sound integration of online and in-person modalities is a participant practice

that combines recorded lessons with interactive discussions during class. From an analytical perspective, this method represents a shift toward learner-centred instruction, in which students are first exposed to the material on their own and then participate in higher-order thinking exercises during in-person sessions. All of these results point to the need for CSU Aparri teachers to “spice up” lesson presentations in order to improve understanding, engagement, and active participation rather than for novelty. Recent study confirms that technology was perceived by both students and teachers as a valuable tool for enhancing learning, highlighting its positive contribution to classroom instruction and the overall educational experience (Azad 2023).

The consistent, continuous and regular integration of technological tools like Google Meet, Zoom, and LENS for sharing screens and presenting lessons demonstrates that educators have gained practical proficiency in utilising digital platforms to achieve their teaching objectives. This finding is supported by Ho et al. (2021) and Haerawan et al. (2024), who highlight how these tools successfully foster flexible and interactive learning spaces. Furthermore, Loo and Annamalai (2024) emphasised that technology functions primarily as a catalyst, adding value and boosting effectiveness to enhance the overall learning experience.

Ultimately, these findings indicate that technology-driven lesson delivery has become a core component of blended instruction at CSU Aparri, signalling an advanced phase of implementation. Together, these classroom practices illustrate how technology is actively reshaping the fundamental structure of lessons. As Mabotha and Ngcamu (2026) emphasized, the rapid advancement of the Fourth Industrial Revolution (4IR) has driven digital transformation across higher education, fundamentally reshaping institutional practices and reinforcing the integration of technology into teaching and learning processes. This transformation provides a strong foundation for adopting blended learning approaches that enhance instructional effectiveness and student engagement.

Theme 2: Facilitating Dialogic Interaction and Meaning Negotiation

Serving as vital conduits for interactive and engaging communication, collaboration and col-

lective meaning negotiation, faculty members were found to practice utilisation of technology beyond sheer and basic content delivery. Moving beyond the usual unilateral transmission model, teachers deliberately embed interactive checkpoints within their digital content to prompt student reflection. As Participant 2 (P2) observed, “Teachers embed questions or activities for students to complete as they watch the presentation.”

This practice calls for concentration and cognition. Within Puentedura’s (2013) SAMR framework, this practice represents a transition from Substitution to Augmentation. The technology does not merely replace static lectures, as it introduces direct functional improvements through embedded, interactive self-assessment tools.

Additionally, faculty practices use real-time interactive whiteboards and asynchronous discussion forums on the Learning Management System (LENS) to advance to the Modification stage of the SAMR model. By offering decentralised spaces where students can express, discuss, and improve their understanding, these platforms drastically alter traditional classroom communication.

By doing this, watching media passively becomes an active, mental activity. Additionally, the use of real-time interactive boards and asynchronous tools like the Learning Management System’s (LENS) discussion boards creates decentralised spaces where students can express, discuss, and improve their understanding. This democratic method of classroom discussion was emphasised by participant 13, who said they use “interactive boards where anyone can post, answer, and react.”

With these technological utilisation practices, teachers combine digital collaboration tools with physical classroom practices to generate an elastic instructional loop (P3, P5). Low-stakes initial learning occurs via pre-recorded media or forum prompts, freeing physical class time for higher-order applications, problem-solving, and dialogic debate. This balance indicates that technology is not being used as an ad hoc additive, but as an architectural element designed to heighten social and cognitive presence in the course.

The observed shift from unilateral content delivery toward interactive, student-centred digital checkpoints strongly reflects Abdallah’s (2024) concept of a blended dialogic socio-constructivist pedagogy. According to Abdallah (2024), technology alone does not possess the intrinsic capacity

to transform instruction. Rather, it is the underlying pedagogical approach to technology integration that determines its transformative value. By embedding real-time prompts, interactive whiteboards, and asynchronous forum spaces within their lesson designs, faculty at Cagayan State University at Aparri move beyond treating digital platforms as static content repositories. Instead, they leverage web-mediated environments to extend classroom discourse and facilitate collaborative knowledge co-construction. This practice validates the socio-constructivist premise that optimal learning occurs when personal reflection and individual task completion are deliberately paired with socio-cultural, interactive dialogue.

The findings demonstrate that technology integration in blended teaching extends beyond the mere use of digital platforms to facilitate content delivery. Instead, participants employed digital tools to foster interaction, collaboration, and meaningful learner engagement, reflecting a shift toward more student-centered instructional practices. This finding aligns with the growing integration of artificial intelligence (AI)-based educational applications in teaching, as recent years have witnessed a significant increase in their use across educational settings. Importantly, pre-service teachers' attitudes toward AI-enabled educational technologies may influence the learning experiences and outcomes of their future students (Zhang et al. 2023).

In a similar vein, according to Goorney et al. (2023) and Jaboob et al. (2024), education in the 21st century has seen a profound transformation, driven by the accelerated advance of emerging technologies. In this context, tools such as artificial intelligence (AI), augmented reality (AR), adaptive learning, and gamification have begun to be integrated into classrooms, providing unprecedented opportunities to enrich teaching and learning. This evolution is important because it improves access to information and facilitates the personalisation of learning, but also because it fosters an environment in which students can interact more dynamically and collaboratively with educational content.

Ultimately, these findings confirm that when digital tools are structured around a participatory, dialogic architecture, technology adoption successfully evolves from basic digital substitution into a transformative, social-learning experience.

As De Bruijn-Smolters and Prinsen (2024) emphasized, achieving the “best of both worlds” in blended learning requires educators to understand how online and face-to-face learning can be effectively integrated to foster student engagement and successful learning. Such understanding is essential for advancing both educational research and higher education practice. The growing body of evidence supports the pedagogical value of blended learning in higher education. Patel (2026) found that blended learning encourages active participation, strengthens learner motivation, and facilitates deeper understanding. These findings further suggest that blended learning serves as an effective approach in teacher education by preparing prospective teachers to integrate technology effectively into classroom instruction.

Theme 3: Gamified Formative Assessment and Real-Time Evaluation

The final core theme from the thematic analysis centres on the systemic shift from traditional, high-stakes testing paradigms to dynamic, gamified formative assessments utilising technology. To address student fatigue and reduce the sense of detachment often experienced in online learning environments, faculty incorporated gamification elements, including points, badges, leaderboards, and immediate feedback, to enhance intrinsic motivation and monitor students' learning progress (Alt 2023). One English language instructor highlighted how gamification made lessons more engaging, particularly when teaching grammar, “My students enjoy games and perceive it as fun. While teaching grammar is boring, I integrate Quizizz in my comprehension checkup part” (P9).

In addition, instructors embedded digital platforms such as Quizizz and Mentimeter (‘Menti’) immediately after instructional segments to assess students' understanding in real time (P11). Compared with conventional paper-based exit tickets, these tools offer immediate feedback and visual representations of class responses, such as word clouds and bar charts. This enables educators to quickly identify common misconceptions, adjust their instruction accordingly, and provide timely, data-driven interventions.

Supporting this observation, recent literature emphasises that integrating Mentimeter into educational settings significantly enhances teaching

and learning by promoting student engagement, active learning, and immediate feedback (Irwanto et al. 2023; Makewa et al. 2014). Mentimeter promotes student engagement by encouraging active participation and collaboration through its interactive and anonymous response capabilities. It also enables instructors to conduct real-time formative assessments, making it an effective instructional tool for both face-to-face and online learning environments (Khan 2026). The present findings further underscore the importance of selecting digital tools that actively promote learner participation and interaction. Interactive technologies, such as Mentimeter, have demonstrated considerable potential in enhancing student engagement across multiple dimensions.

In their case study, Rosmayanti et al. (2025) reported that the use of Mentimeter substantially improved behavioural engagement by increasing participation and attendance during interactive, gamified learning sessions. The study also found that students exhibited greater emotional engagement, expressing increased enjoyment and interaction with learning activities, while cognitive engagement was strengthened through enhanced critical thinking, idea generation, and improved understanding and retention of course content. These findings reinforce the present study's observation that technology-mediated instruction, when designed to encourage interaction and collaboration, creates more meaningful learning experiences and promotes active student engagement in blended learning environments.

Furthermore, implementing token-economy mechanics, such as "awarding points, badges, or rankings" (P14), serves as an external motivator that reduces friction and encourages sustained engagement with challenging academic content. Integrating gamification into blended learning environments can significantly improve students' motivation and academic performance. The findings offer valuable implications for higher education institutions and educators seeking to design more engaging and effective instructional approaches. Notably, self-regulation emerged as a significant moderating variable, strengthening the relationship between blended learning and intrinsic motivation, as well as between intrinsic motivation and learning effectiveness. Overall, the study by Bang and Huong (2025) highlights the important contribution of gamified blended learning in

fostering students' intrinsic motivation and enhancing learning outcomes. Zain (2026) found that on assessment of learning outcomes, learner engagement, effective instructional design, access to reliable technology, and institutional support are critical factors shaping positive blended learning experiences. The study further revealed that students experienced meaningful learning gains and improved application of knowledge, demonstrating the potential of blended learning to foster both cognitive and skill development. Today's students have become increasingly adaptable to technology-mediated instruction, enabling them to fully embrace online learning environments. This adaptability is further strengthened through innovative pedagogical approaches such as gamification, which has been shown to enhance student engagement, motivation, and academic achievement by creating interactive and meaningful learning experiences (Riega-Virú et al. 2025).

Analytically, these gamified strategies transform assessment from a stressful summative event into a low-stakes, interactive milestone. This validates Xiao and Hew's (2024) assertion that gamified frameworks enhance behavioural participation, foster positive emotional transitions, and mitigate student anxiety in digital learning environments.

CONCLUSION

This study concludes that teachers at Cagayan State University at Aparri effectively integrate technology into blended teaching by utilising digital tools to enhance lesson presentation, facilitate meaningful student-teacher interaction, and improve assessment and evaluation practices. These technology integration practices contribute to more engaging, interactive, and learner-centred instructional experiences consistent with the higher levels of the SAMR framework. However, maximising the potential of blended learning requires continuous professional development, adequate technological infrastructure, and sustained institutional support to address existing challenges related to digital competence and resource accessibility.

RECOMMENDATIONS

Based on the findings, several recommendations can be made to further improve the use of technology in blended learning environments as follows.

Opportunities for ongoing professional development that concentrate on the successful incorporation of technology into teaching methods must be made available by the training office. Training sessions should focus on enhancing teachers' digital literacy, familiarising them with new tools, and equipping them with strategies to effectively integrate technology into their lessons. The administration should likewise ensure that teachers have access to up-to-date technological resources and platforms. Investing in reliable internet infrastructure and digital tools will enable teachers to fully utilise the potential of blended learning approaches. Faculty communities or teaching networks can be established where teachers can discuss their challenges, successes, and innovative approaches to using technology in blended learning. The use of gamified and interactive assessment tools, such as Quizizz and Menti, should be further promoted by faculty members. These tools not only motivate students but also provide teachers with immediate feedback on student progress, allowing for timely interventions. Lastly, further research is needed to explore the long-term impact of technology integration on student performance and learning outcomes. Additionally, studies should investigate the specific challenges faced by teachers with varying levels of technological proficiency and access to resources.

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